

**CLAIMS**

What is claimed is:

1. A method of manufacturing a polyisocyanurate foam insulation board, the method comprising:

5                   contacting a stream of reactants that comprise an isocyanate-reactive compound with a stream of reactants that include an isocyanate compound to form a reaction product, where said step of contacting takes place in the presence of a blowing agent and a low-boiling inert gas, and where the amount of low-boiling inert gas present at the time of said contacting is sufficient to result in frothing of the reaction product.

- 10                 2. The method of claim 1, where said amount of low-boiling inert gas is an amount that is sufficient to increase the volume of the reaction product by at least 1.25.

15                 3. The method of claim 1, where said amount of low-boiling inert gas is an amount that is sufficient to increase the volume of the reaction product by at least 1.5.

20                 4. The method of claim 1, where said amount of low-boiling inert gas is an amount that is sufficient to increase the volume of the reaction product by at least 2.0.

25                 5. The method of claim 1, where said amount of low-boiling inert gas is greater than 1.25 times the amount of the Bunsen Coefficient for the low-boiling inert gas within the stream of reactants that comprise an isocyanate-reactive compound.

30                 6. The method of claim 1, where said amount of low-boiling inert gas is greater than 1.5 times the amount of the Bunsen Coefficient for the low-boiling inert gas within the stream of reactants that comprise an isocyanate-reactive compound.

7. The method of claim 1, where said amount of low-boiling inert gas is greater than 2.0 times the amount of the Bunsen Coefficient for the low-boiling inert gas within the stream of reactants that comprise an isocyanate-reactive compound.

5 8. The method of claim 2, where the low-boiling inert gas is nitrogen.

9. The method of claim 5, where the low-boiling inert gas is nitrogen.

10. In a method of manufacturing polyisocyanurate insulation boards, the  
10 method being of the type that includes contacting a stream of reactants that include an isocyanate-reactive compound with a stream of reactants that include an isocyanate compound to produce a reaction product, where the step of contacting takes place within a mix head in the presence of a blowing agent, the improvement comprising adding a low-boiling inert gas to at least one of the  
15 stream of reactants prior to the reaction product exiting the mix head, where the amount of low-boiling inert gas that is added is sufficient to cause the reaction product to froth within two seconds of leaving the mix head.

11. The method of claim 10, where the low-boiling inert gas is added to the  
20 stream of reactants including an isocyanate-reactive compound.

12. The method of claim 11, where said amount of low-boiling inert gas is an amount that is sufficient to increase the volume of the reaction product by at least 1.25.

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13. The method of claim 11, where said amount of low-boiling inert gas is greater than 1.25 times the amount of the Bunsen Coefficient for the low-boiling inert gas within the stream of reactants that comprise an isocyanate-reactive compound.

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14. The method of claim 12, where the low-boiling inert gas is nitrogen.

15. The method of claim 13, where the low-boiling inert gas is nitrogen.

16. A method for increasing the dimensional stability of polyisocyanurate foams, the method comprising:

providing an A-side stream of reactants that include an isocyanate;

5 providing a B-side stream of reactants that include a isocyanate reactive component and a blowing agent;

adding a low-boiling inert gas to the A-side or B-side stream of reactants;

10 contacting the A-side and B-side reactants within a mix head to form a developing foam; and

depositing the foam onto a laminator.

17. The method of claim 16, where the amount of low-boiling inert gas added is an amount that will increase the volume of the developing foam by at least 1.5.

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18. The method of claim 17, where the amount of low-boiling inert gas added is an amount that will increase the volume of the developing foam by at least 2.0.

19. The method of claim 16, where the low-boiling inert gas is nitrogen and the  
20 nitrogen is added to the B-side stream of reactants.

20. The method of claim 16, where the amount of nitrogen gas added to the B-side stream of reactants is an amount sufficient to increase the amount of low-boiling inert gas within the B-side stream of reactants to an amount that is greater than 1.25 times the Bunsen Coefficient for the low-boiling inert gas within the B-side stream of reactants.